

Interactive comment on “Global emissions pathways under different socioeconomic scenarios for use in CMIP6: a dataset of harmonized emissions trajectories through the end of the century” by Matthew J. Gidden et al.

Anonymous Referee #3

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Dear the authors of the manuscript,

This paper describes the key emission data for climate model projection studies. The emission data are being used in the ongoing climate model simulation projects, such as ScenarioMIP. Thus, the significance of the emission data is obvious and a detailed description of the emission data is of great interest to the audience of the GMD, especially the current and future users of the emission data. However, I would suggest some more work to improve the manuscript before being considered for publication.

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First of all, some of the key parts in the methodology are supported by unpublished documents that we can't find anywhere, such as Hurtt et al. (2018) for land use, Feng et al. (2018) for gridding, and Meinshausen (2018) for concentrations. This means that we referees are not given enough information to review this manuscript. I don't know why other two referees seemed to be ok with this situation. I should also point out that it's been several months since this manuscript was originally submitted to GMD and we can't still find the documents referred. Since those documents are not available even on the GMD discussion stage, the authors should provide adequate descriptions of those unpublished studies to complete the manuscript as a description paper.

The authors wisely used the references in order not to make the manuscript lengthy. I however feel that some parts of the manuscript needed more description to fully guide the users of the emission dataset (I agree with another referee). As stated in the conclusion section by the authors, the emission data should allow the users to answer scientific questions in the climate studies. In order to do so, this description paper should adequately provide details of the emission data, such as the methodology and underlying data used, and allow the users to figure out science questions that can be (or cannot be) addressed using the emission data and then design studies. For example, the downscaling and emission gridding sections can be greatly improved. The 2.1.3 Region-to-country downscaling section provides the general description. But we don't learn how exactly the authors dealt with the differences in the region definitions among different models. The authors only showed the differences in the region definitions by the numbers of the regions and did not explain well one of the challenging processes in the downscaling. Such information are useful as the users can learn what was done and figure out potential limitations when interpreting the emission data and/or results. Also, the emission gridding section seems to be poor considering the amount of work that the authors must have done. The authors mentioned that the gridding procedure is generally the same as Hoesly et al. (2018) (which is well-written, informative paper in my opinion). Hoesly et al. (2018) provided a great amount of information regarding the data used for emission gridding. Looking at the huge data table in Hoesly et al.

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(2018), I would ask what does remain the same in this study and what does not. This might have not been a problem with the Feng emission gridding paper although.

The authors could improve the code data available section, too. In my opinion, the author should provide the list of data they provide from this study with the names of the data. I am suggesting this because I could not find the gridded emission data from the data site listed. Also, if available, the versions of emission data are important to add for traceability.

Sincerely, Referee #3

Interactive comment on Geosci. Model Dev. Discuss., <https://doi.org/10.5194/gmd-2018-266>, 2018.